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Contribution by women**

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I. Introduction

1. The lack of access to modern energy and the effects of climate change are interlinked. Their impact on women's lives, both in developing and industrialized countries, reflects the gender inequalities and inequities prevailing in the social, economic and political arenas.

2. More than 2 billion people in developing countries, particularly in rural areas, use traditional fuels, such as wood, charcoal and dung for cooking, and lack basic modern energy services. The lack of access to affordable energy services is a major barrier to sustainable livelihoods and emergence from poverty. Seventy per cent of the 1.3 billion people in developing countries living on less than one dollar a day are women, therefore it follows that energy poverty is a problem that has a disproportionate effect on women.

3. The North-South dimension of the problem must also be considered, especially in the light of climate change mitigation and adaptation policies and energy consumption patterns. As highlighted by Agenda 21, current levels of energy consumption and production are not sustainable, especially if demand continues to increase. Overconsumption of energy in industrialized countries is accompanied by lack of access to energy in developing countries, which affects their capacity to meet their basic needs and combat poverty. The linkages between gender equality and energy consumption and production also have consequences in terms of mitigation responses to climate change. Addressing the gender aspects of energy for sustainable development and climate change will ensure a more just political response and help to formulate more appropriate poverty-reduction policies and strategies, since women are disproportionately represented among the poorest of the poor.

4. In 1992, the United Nations Conference on Environment and Development produced Agenda 21, which recognized the advancement of women as an essential element of sustainable development. The Fourth World Conference on Women in 1995 adopted the Beijing Platform for Action, in which Governments agreed to support women's equal access to sustainable and affordable energy technologies and to use participatory needs assessments to design national energy plans. In 2001, the Commission on Sustainable Development at its ninth session urged Governments to address the health and safety concerns of women and children in rural areas, including the impact of carrying fuel wood over long distances and exposure to smoke from open fires. It also recommended international cooperation to promote women's equal access and opportunities to energy and their greater involvement in energy policy decision-making processes.

5. Other United Nations conferences have acknowledged the importance of adopting a gender-specific approach to implementing policies, and gender equality has been identified as one of the Millennium Development Goals, designated a cross-cutting theme for work of the Commission. Yet when it comes to energy, climate change and environmental protection, United Nations agencies, national Governments, international organizations and non-governmental groups still fail to integrate gender perspectives adequately into policies and actions.

II. Energy for sustainable development and gender in developing countries

6. Affordable, locally appropriate and environmentally sustainable sources of energy are needed everywhere for social and economic development. In developing countries, especially in rural areas and "informal" urban settlements, lack of energy is a crucial factor that limits people's efforts to escape poverty and expand their productive activities. To reach development objectives in such settings, including the Millennium Development Goals, emphasis must be placed on increasing access to sustainable and affordable energy sources.

A. The issues at stake

7. Although everyone needs energy, in many communities women suffer the most from "energy poverty" because they are responsible for supplying their families with food, fuel and water, often without the benefit of basic modern infrastructure. Lack of energy for household needs and small-scale enterprises limits the ability of women to take care of their families and themselves, pursue higher levels of education, earn income and participate in social and community affairs.

8. Without access to convenient, affordable fuels for cooking and heating, women have to spend large amounts of time and physical energy obtaining traditional fuels (such as wood, charcoal, dung and agricultural wastes) to heat water and cook meals. At the same time, women in rural areas often have to grow and process their own food, as well as transport heavy loads, without any motorized equipment. If they do not have running water or motorized pumps for their homes, women also have to spend time each day gathering water from taps, or even polluted wells, rivers or springs. As wood and other traditional fuels become scarce due to over-harvesting, land clearing, armed conflicts or environmental degradation, some women have to travel longer distances to find fuel. While women are searching for fuel — especially those forced to seek shelter in refugee camps — they face the risk of assault and violence, as well as injury due to dangerous terrain, snakes and wild animals.

9. Indoor air pollution is a major problem. Working over indoor fires exposes women to smoky conditions that cause respiratory and other illnesses. In low-income homes, especially in rural areas and "informal" urban settlements, women often spend many hours a day near an open fire cooking meals or, in cold months, tending it for warmth. As a result, they are exposed to harmful levels of gases, particles and other dangerous compounds, such as carbon monoxide, benzene and formaldehyde. Indoor air pollution is responsible for more than 1.6 million deaths per year due to pneumonia, chronic respiratory disease and lung cancer. Other conditions associated with indoor air pollution include asthma, bronchitis, tuberculosis, cataracts, low birth weight and heart disease.

10. The particular needs of women with respect to improved access to energy are rarely taken into account in national policies and projects. Energy agencies tend to focus on increasing fossil fuel supplies and expanding electrical distribution grids for industrial and urban expansion. While many energy managers are male engineers with primarily technical expertise, a transition to more sustainable energy sources

will require decision makers to also consider social concerns, including the gender-differentiated needs and impact of proposed sustainable energy initiatives.

11. Relatively simple changes — such as gathering data from both men and women — provide crucial evidence of how a particular energy policy might have an impact on men and women differently. More appropriate measures, based on the insight and experiences of all those most directly involved, can then be drawn up and put in place to ensure that the project reflects the genuine needs and concerns of all prospective beneficiaries.

B. Women's energy needs

12. Women's energy needs are not necessarily different from those of men. However, where social traditions dictate that men and women have distinct roles and responsibilities based on their gender, inattention to those differences can lead to policies and projects that do not improve the lives of women (especially those in poor communities) and may even make their lives more difficult by reinforcing women's low status, economic disadvantages, poor health and lack of power. Energy priorities identified by women include:

(a) Clean fuels and equipment for cooking, heating and productive uses. Since women are responsible for preparing food in many cultures, there is much emphasis on the need for clean-burning fuels that are affordable and convenient to obtain. In places where it was once relatively easy to get firewood or charcoal, traditional fuel sources may now be scarce due to environmental degradation; women would therefore benefit from increased availability of modern fuels, such as liquefied petroleum gas, or biofuels and biomass briquettes that can be produced locally from crops and agricultural residues available in rural areas. More efficient stove technologies, ventilation and solar cookers could also help reduce the dependency on unhealthy fuels and the air pollution caused by them. Since many of women's business activities also involve cooking or heat processing, better fuels and thermal equipment can also advance women's economic opportunities;

(b) Motorized equipment for grinding, pumping, agriculture, and transportation. Women need alternatives that require less physical energy for planting, irrigating and harvesting crops, grinding grains and processing staple foods, hauling water for household, agricultural and commercial uses, and for transporting goods and materials. Relief from these strenuous daily tasks would help women preserve their health and allow them to pursue educational and economic opportunities or spend more time with their families. Water pumps and motorized equipment can be powered by electricity from grid, solar, wind or hydro generators, by engines run on diesel fuel or modern biofuels or by wind or water mills;

(c) Electricity for lights, appliances, communications and computers. Household lighting and communications equipment allows women who operate home-based enterprises compatible with their household and care-taking responsibilities to expand their reading, working and leisure time, improve their efficiency and knowledge base, and become more socially and politically engaged. Where grid connections are unavailable, electricity can be produced using decentralized generators running on diesel or biofuels, or wind, solar or water power.

C. Major challenges and strategies

13. Building greater understanding of the linkages between gender, energy and development. Because much of women's daily labour is unpaid or outside the "formal" economy, their contributions to social and economic development continue to be undervalued. Discrimination against women is directly related to their higher rates of poverty, ill health and illiteracy. Persuading decision makers in developing countries to invest in basic energy infrastructure to reduce women's current burdens could bring substantial returns in terms of meeting the commitments of Agenda 21 and the Plan of Implementation of the World Summit on Sustainable Development, as well as the Millennium Development Goals, by increasing options for producing income and reducing poverty levels (Goal 1); providing more educational opportunities for women and girls (Goal 2) and greater empowerment of women (Goal 3); improving health and safety for women and their families (Goals 4, 5 and 6); and ensuring more sustainable use of natural resources (Goal 7).

- The main strategies employed by advocates include lobbying national Governments, agencies and donors at international meetings, building public awareness with explanatory materials, toolkits and training materials and producing research on best practices relating to the integration of gender and energy concerns into sustainable energy policies, programmes and projects.

14. **Enabling women's voices to be heard in decision-making**. Women are currently underrepresented in energy policymaking positions, and generally still face constraints in decision-making process at all levels of social organization, whether it be in national and local government or in their own homes and workplaces. Although having more women in positions of political power might not guarantee that the energy concerns of women living in poverty become national priorities, their greater participation in the design and implementation of sustainable energy initiatives would increase the likelihood that women as well as men will benefit from them.

- Helpful strategies for increasing women's involvement in decision-making include capacity-building and technical training to enable their participation in the energy sector, and promotion of participatory processes and needs assessments that facilitate the participation of more women in national and local decisions about energy policies and projects, as well as in collection and analysis of gender-disaggregated data in all energy initiatives.

15. **Addressing constraints affecting women's access to energy technologies**. Sometimes new sources of income using energy-related equipment can help pay for improved energy services, but women tend to have difficulty earning enough income, raising capital or obtaining credit for investing in such equipment. Furthermore, women are often constrained by social and legal traditions that limit their options to own land or property that could be used as collateral to borrow money without a co-signer or to obtain technical training.

- Strategies to address these constraints include making available to women small-scale, affordable energy equipment and fuel containers, financing that is responsive to women's credit constraints, and technical training that is convenient and appropriate for women's schedules. Assuring women's land rights is also critical to improving their access to energy resources.

16. **Empowering women to become energy entrepreneurs**. Women and girls will need to gain greater confidence and expertise in business and technical matters in order to become more actively involved in social and economic development activities. Community projects that involve women in sustainable energy enterprises can provide training, experience and self-confidence, as well as encourage women to find solutions to meet their own energy technology needs. Such projects can also serve as starting points for women and girls to pursue higher levels of education in engineering and science so that they can become more active in the energy sector.

- Strategies that can be employed include: supporting women and women's groups undertaking sustainable energy enterprises and initiatives; providing training in business and production skills; and encouraging women and girls to obtain advanced degrees in science and engineering.

D. Lessons learned

17. Supportive Government policies help to promote the integration of gender concerns into energy policies, projects and planning processes. For example, in Uganda, the National Gender Policy was a significant factor in the gender-responsiveness of the Uganda Photovoltaic Pilot Project for Rural Electrification, which was designed to overcome financial, social and institutional barriers affecting access to solar technologies.[1]

18. Energy programmes work best when they are included in integrated approaches to community development involving both women and men. The rural energy development programme in Nepal has used the installation of microhydro power systems as an entry point for community economic development, and ensured that both men and women participate in planning processes by establishing separate male and female committees that then work together on specific projects chosen by the community as a whole. The project's emphasis on including women and on gender and power relations has made it a model for gender-sensitive energy planning.[2]

19. Participatory processes allow stakeholders to identify specific energy and development needs. In Bangladesh, for example, a project supporting the production of battery-operated lamps by rural women, entitled "Opportunity for women in renewable energy technology utilization", was designed with input from local women after surveys showed that they had identified household lighting as a priority in their remote off-grid location. The women learned to produce the lamps in a microenterprise manufacturing facility and distributed them through rural markets.[3]

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[1] "Uganda: Gender Responsive Planning for Access to Solar Technology Through Establishment of Appropriate Financing Mechanisms" Sengendo and Turyahikayo, 2002, www.energia.org/pubs/papers/wssd_africa_regpaper.pdf, and "Uganda Photovoltaic Project for Rural Electrification", Sengendo, in *Generating Opportunities: Case Studies on Energy and Women*, United Nations Development Programme, 2001, www.undp.org/energy or www.energia.org.

[2] "Nepal rural micro hydro development programme", Rana-Dueba, in *Generating Opportunities: Case Studies on Energy and Women*, UNDP, 2001, www.undp.org/energy.

[3] "Battery-operated lamps produced by rural women", Khan in *Generating Opportunities: Case Studies on Energy and Women*, UNDP, 2001, www.undp.org/energy.

20. Income-generating uses of energy technologies can help make energy services affordable to women and increase their social and political status. The Mali multifunctional platform project for village power has enabled women's groups to use diesel generators to operate a variety of end-use equipment, including grinding mills, oil pressers and battery chargers, as well as to run lights and water pumps. By charging for these energy services, they have increased their own incomes and gained respect for bringing significant benefits to their villages.[4]

21. The introduction of energy technologies, such as improved stoves, to meet environmental goals will be most successful if they also address the needs of the people meant to use them. For example, in India, a small non-governmental organization called Technology Informatics Design Endeavour found that women in rural areas rejected stoves distributed by the Government to reduce consumption of fuel wood, because they did not reduce smoke, which was more important to the women. New designs that met women's needs were rapidly adopted without any Government intervention.[5]

III. Energy for sustainable development and gender in industrialized countries

22. In industrialized nations, gender bias and social and economic differentials are also evident in terms of access to energy, affordability and women's role in achieving it, as well as in the absence of women at the decision-making level of the energy sector. Overconsumption in industrialized countries weakens the capacity of developing countries to cover their energy needs and to combat poverty, which primarily affects women.

A. The issues at stake

23. Access to energy, especially to "clean" energy, is more difficult for women in Eastern Europe than for women in Western Europe. Gathering wood for fuel to produce energy for domestic needs exposes women to high risks of psychological and physical violence, not only in former war zones such as Kosovo or Chechnya, but also in many peaceful but impoverished transitional countries.

24. Governments are ultimately responsible for the provision of basic human needs. The liberalization or privatization of essential public goods such as water, energy and transport is problematic, because responsibility is shifted from Governments to private investors, who remain largely unaccountable to citizens in general. The situation has a negative impact on the poorest, and in particular on women's lives. In the European Union, the liberalization of energy markets has reduced energy prices and given consumers more choices in terms of suppliers, but at the expense of quality and availability (for example, some public transport

[4] See description at www.ptfm.net and "Multifunctional platform for village power", Burns and Coche, in *Generating Opportunities: Case Studies on Energy and Women*, UNDP, 2001, www.undp.org/energy.

[5] "Rural women as agents of improved woodstove dissemination: a case study in Huluvangala Village, Karnataka, India", Bhogle, in *Energy for Sustainable Development*, VII, No. 3, September 2003, www.ieiglobal.org/esd.html.

services have been cut back or made to cater exclusively to the needs of people in paid employment, or water quality has fallen while prices have risen). Previous privatization processes in energy and water supply showed that private households had profited substantially less from the liberalization of energy than industry; across the European Union, private households paid on average 60 per cent more for their electricity than industry in 2003, compared with 51 per cent in 1994. At the same time, liberalization is accompanied by massive job cuts, which are frequently detrimental to the advancement of women.

25. Rising energy prices affect accessibility to energy and its usage by the poorest, particularly elderly women and single mothers; for example, women on low incomes tend to live in poorly insulated houses, equipped with old and less energy-efficient domestic appliances. Both factors lead to a higher demand for energy, and consequently higher expenditure on energy as a proportion of the overall household budget, which may, in turn, lead to energy poverty.

26. Energy poverty is a growing problem in industrialized countries, where many households need to spend around 20 per cent of their income on all fuel use to heat the home to an adequate standard and for meeting their needs for lighting, cooking and running domestic appliances. The recent rise of oil and gas prices showed a direct impact on poor households, which are forced to take out loans for their energy bills. In Canada (e.g. in 2003), the lowest fifth of low-income households spend over 14 per cent of their income on fuel and electricity, which is three times as much as all households in Canada.[6] Comparable data for the United Kingdom of Great Britain and Northern Ireland indicate that 19.2 per cent of single pensioner households or 16.8 per cent of lone parent households face energy poverty,[7] in both cases with a large share of women. Heating or cooling and cooking can be problematic for people on low incomes if they have a restricted choice of energy forms; electricity is expensive and solid fuel produces smoke, which has a negative impact on health.

Energy poverty affects women's and children's health

Women's projects in Armenia and Uzbekistan repeatedly report that energy poverty is a major problem. In order to keep warm and to have energy for cooking, poor households are forced to burn their domestic waste, which contains high percentages of plastic and other synthetic materials. The health impact is immense, and women, who are exposed when heating and cooking, are most vulnerable. Burning waste in burn barrels or woodstoves creates toxic airborne soot particles that can enter the body through the eyes, the protective mucous in the nose or the capillaries in the lungs. The effects can include damage to the lungs, nervous system, kidneys and liver. Chronic diseases, such as bronchitis, emphysema and most cancers, can take 20 years to develop and can be caused by low exposure levels to smoke and toxins that originally appeared harmless. Children can be at much greater risk; because of their smaller body size, they inhale more air per pound of body mass than do adults, therefore absorbing a proportionately larger dose of toxins.[8]

[6] Canadian Housing and Renewal Association, http://chra-achru.ca/english/view.asp?x=654&id=400.

[7] Centre for Sustainable Energy (2003), http://www.cse.org.uk/pdf/sof1006.pdf.

[8] See Waldbott, G., *Health Effects of Environmental Pollutants*, 1973.

Children's bodies are also more susceptible to damage from the mercury, lead, cadmium and other heavy metals found in the smoke of trash fires because their nervous systems are not fully developed.

27. In many countries, women are more severely affected by energy policy taxation instruments, such as eco- or energy taxes, because the proportion of their already lower incomes that has to be spent on energy rises as a result (although the eco-tax does have a more positive influence on the energy-saving behaviour of women than on that of men).

28. Women and men differ in their preferences regarding energy production. In Finland, for example, only 14 per cent of women supported long-term use of nuclear power compared to 46 per cent of men. Similar results have been obtained from many other countries, including Germany, India, the Republic of Korea and the United States of America. The reasons given by women include the health risks, the risks associated with the technology itself (such as the 1986 Chernobyl reactor disaster and the possibility that such facilities could be possible targets for terrorist attacks), and the unsolved problem of nuclear waste, which shifts the consequences of our present-day energy consumption on to future generations.

Is nuclear energy a safe alternative?

The experience of Chernobyl is proof that nuclear energy can be very dangerous, despite efforts by the pro-atomic lobby to present nuclear energy as a safe and useful alternative. In the fields of science and medicine, it is widely accepted that there is no safe threshold for radiation impact on living organisms, meaning that any additional radiation exposure, however small, will inevitably cause negative effects among members of the exposed group, although it is not possible to predict exactly who will suffer, when or in what way.

29. Energy consumption in industrialized countries also reveals a significant gender component. For example, in the transport sector, women in all age and income groups consume energy; they use more public transport and drive more energy-saving cars. In addition, the transport sector is the area with the greatest growth rate, which generates an increase of energy consumption and has an impact on climate protection, land use and biodiversity. However, outside the transport sector, few gender comparative consumption studies have been conducted. Some outstanding questions are: Who consumes energy for what purpose and at what level (e.g. for care work, information and communication technology and communications, leisure activities)? How is energy demand generated or reduced and by what means (such as heat insulation, energy-efficient appliances, geographical accessibility)? Who is affected by energy-saving measures and in what role, and what does that mean in terms of possible additional work (externalization of gender-specific loads)?

30. A few studies on energy-saving measures and instruments, with a gender perspective have been conducted. The studies show that, as a rule, women and men favour different measures. For example, men have substantially more faith in technical solutions to problems, whereas women consider behaviour and lifestyle to be essential. At the same time, women are less informed about energy-saving measures than men. This is linked to the technical bias of information campaigns and/or a failure to address the target group adequately.

31. Women tend not to be involved in decisions about technical solutions to reduce energy consumption, partly because relatively few possess technical qualifications. Also, women have fewer financial resources and therefore less access to residential property, which means fewer women are making decisions about technical solutions as home owners, such as whether to install thermal-insulation and energy-efficient heating systems, or to use solar energy.

32. The low proportion of women employed in the energy industry and their marginal involvement in planning and decision-making are also illustrative of gender inequality and inequity related to energy. While the proportion of women in the energy sector has started to rise in recent years, the sector is still dominated by men, particularly in the technical areas. In Australia, women make up 20 per cent of the workforce in the electricity, gas and water sectors, but occupy less than 5 per cent of technical posts; in Germany, the share of female technical staff in the energy industry is around 6 per cent, in decision-making positions 4 per cent. Women in the energy industry work mainly in administration, sales, finance, catering and personnel. The energy sector has a highly masculine image. This is known to be a significant barrier to female participation.

33. In the area of renewable energies, according to a recently conducted survey in Germany, management and supervisory boards in trade associations and companies are composed almost exclusively of men. The situation appears somewhat better among the energy distributors and in local and regional pressure groups. The burgeoning renewable energies sector must be monitored and evaluated closely from the gender perspective, because many jobs have been and will continue to be generated here.

34. Energy companies are beginning to recognize that women bring benefits to the workplace. For example, in Canada, the oil and gas sector is promoting a diverse workforce and recognizing the contributions people make as capable individuals rather than as members of designated groups.

B. Lessons learned

35. In order to demonstrate the linkages between gender equality and sustainable energy policies, it is important to dedicate resources for research and data collection and to disseminate case studies that promote best practices and share lessons learned.

36. The implementation of gender mainstreaming in many European countries is now providing the opportunity to close existing gaps. Instruments have been developed for monitoring gender impact, but gender analyses of measures in the energy sector are currently still being carried out very much in isolation. Initial

research projects incorporating gender-related issues are being developed, but results and findings are not yet available.

37. The 2004 International Conference for Renewable Energies in Bonn, Germany, provided an example of the benefits of involving gender experts and incorporating the gender perspective. A women's group presented the concerns of advocates, which were supported by many Governments. Recommendations by women's organizations to integrate the gender perspective, develop appropriate instruments and implement further training were incorporated into the International Action Plan agreed on at the conference and could be instructive in the Commission for Sustainable Development process.

C. Challenges

38. In order to achieve progress in the degree to which the gender perspective is taken into account in the energy sector, the following requirements will have to be met:

(a) Gaps in data and statistics in the area of gender and energy must be filled as a matter of urgency. At the local, regional or national levels, this applies to energy consumption by men and women based on types and purposes of use; preferences of women and men with regard to energy production and energy policy instruments and measures; findings concerning the conditions underlying energy-saving measures and their gender-differentiated effects; analyses of planning and investment in the energy sector that take into account gender-differentiated/economic preferences and knock-on effects; and the proportion of women and men among employees and in decision-making posts in the energy industry and in bodies concerned with energy policy.

(b) Existing instruments for reviewing the effects on both sexes of measures, programmes and plans in the energy sector must be utilized and developed further.

(c) The allocation of funds in the energy sector should be tied to the implementation of gender mainstreaming.

(d) NGOs, in particular environmental ones, must be made aware of gender perspectives in the energy sector and trained to integrate gender into their work. The same applies to the other major groups represented in the Commission on Sustainable Development process.

(e) Case studies reflecting the gender aspects of energy policies and practices in industrialized countries must be collected, evaluated and used to replicate successful strategies, devise practical plans of action and identify possible obstacles.

IV. Gender aspects of climate change

39. Climate change is an environmental problem with a strong political and development component. The impact of global climate change is not only physical and economic (for instance, in the form of natural disasters), but also social and cultural, jeopardizing environmentally based livelihoods in many areas of the world.

40. The Intergovernmental Panel on Climate Change predicted that climate change impact would be differently distributed among different regions, generations, age classes, income group, occupations and genders. It also stated that the impact of climate change would fall disproportionately upon developing countries and the poor persons within all countries, and thereby exacerbate inequities in health status and access to adequate food, clean water, and other resources. People living in poverty are more vulnerable to environmental changes. The gender-poverty links show that 70 per cent of the poor in the world are women and their vulnerability is accentuated by race, ethnicity and age. When natural disasters and environmental change occur, women and men are affected differently because of traditional, socially based roles and responsibilities.

41. Most climate change issues, policies and programmes are not gender-neutral. For that reason, several areas deserve attention, specifically: gender-specific resource-use patterns; gender-specific effects of climate change; gender aspects of mitigation and adaptation; gender and decision-making on climate change; women's capacity to cope with climate change; and gender-related patterns of vulnerability.

42. It is widely recognized that industrial countries bear the main responsibility for greenhouse gas emissions, but the impact is felt most severely in developing countries. It is therefore relevant to analyse the gender aspects of climate change in developed countries from the angle of emissions and to also consider mitigation strategies from a gender perspective. To date however, the critical issues of who is responsible for CO_2 emissions and through which activities, of how social, political and planning conditions affect emission reduction, and of the role played by gender in increasing or curbing emissions, have scarcely been identified, much less debated.

A. The issues at stake

43. Climate change has many gender-specific characteristics: (a) women are affected differently, and more severely, by climate change and natural disasters because of social roles, discrimination and poverty; (b) women are still underrepresented in decision-making about climate change, greenhouse gas emissions and adaptation/mitigation; and (c) there are gender biases in carbon emissions. They should be included not only because they are most vulnerable, but also because they have different perspectives and expertise to contribute. Gender is a significant dimension to be taken into account when understanding environmental change. Perspectives, responses and impact related to disaster events are different for men and women, as they have different social responsibilities, vulnerabilities, capabilities and opportunities for adjustment and unequal assets and power relations. They experience environmental change and disasters differently.

Women are affected differently and more severely

44. The effects of climate change manifested in the increase of extreme weather conditions, such as hot summers, droughts, storms or floods, have a more severe impact on women than on men, both in developing and in developed countries. For example, the 20,000 people who died in France during the extreme heat wave in Europe in 2003 significantly included more elderly women than men.

(a) In natural disasters that have occurred in recent years, both in developing and in developed countries, it is primarily the poor who have suffered — and all over the world, the majority of the poor are women, who at all levels earn less than men. In developing countries, women living in poverty bear a disproportionate burden of climate change consequences. Because of women's marginalized status and dependence on local natural resources, their domestic burdens are increased, including additional work to fetch water, or to collect fuel and fodder. In some areas, climate change generates resource shortages and unreliable job markets, which lead to increased male-out migration and more women left behind with additional agricultural and household duties. Poor women's lack of access to and control over natural resources, technologies and credit mean that they have fewer resources to cope with seasonal and episodic weather and natural disasters. Consequently, traditional roles are reinforced, girls' education suffers and women's ability to diversify their livelihoods (and therefore their capacity to access income-generating jobs) is diminished.

Women have been disproportionately affected by the Asian tsunami

An Oxfam report (March 2005) on the impact of the 2004 Asian tsunami on women raised alarms about gender imbalances, since the majority of those killed and among those least able to recover were women. In Aceh, Indonesia, for example, more than 75 per cent of those who died were women, resulting in a male-female ratio of 3:1 among the survivors. As so many mothers died, there have been major consequences with respect to infant mortality, early marriage of girls, neglect of girls' education, sexual assault, trafficking in women and prostitution. These woes, however, are largely neglected by the media.[9]

(b) Climate change, which reduces crop yields and food production particularly in developing countries, affects women's livelihood strategies and food security, and therefore their right to food. Women are responsible for 70 to 80 per cent of household food production in sub-Saharan Africa, 65 per cent in Asia, and 45 per cent in Latin America and the Caribbean. Traditional food sources may become more unpredictable and scarce as the climate changes. Droughts and flooding can be detrimental to women who keep livestock as a source of income and for security. Women's knowledge and experience of maintaining biodiversity through the conservation and domestication of wild edible plant seeds and food crop breeding is the key to adapting to climate change more effectively.

(c) Both in developing and in developed countries, women are primary caregivers, combining the care for children and the elderly with their domestic and income-earning activities. These additional responsibilities place additional burdens on women, with an impact on their ability to work outside the home and to deal with the effects generated by environmental changes caused by global warming.

[9] Deepa Kandaswamy, 2005; http://coanews.org/tiki-read_article.php?articleeId=255.

Environmental degradation exposes the girl child to more work and less education

In a study conducted on behalf of ActionAid in 1993 and 1994 in the Himalayan region of Nepal, it became clear that environmental degradation had compounded stress within households and pressure on scarce resources. This meant that the pressure on children, particularly girl children, to do more work and at an earlier age was increasing. Girls do the hardest work, have the least say and the fewest education options. Programmes that concentrate only on sending more girls to school were failing as the environmental and social conditions of the families deteriorated.

(d) In traditional societies, women are even more vulnerable to the impact of climate change because they are often not allowed to participate in the public sphere, and are therefore less likely to receive critical information for emergency preparedness. They are also less mobile due to strict and gendered codes of social behaviour, and have fewer chances to escape from affected areas.

(e) Climate protection instruments may affect women and men differently because of their differing economic status.[10] Financial support of technical measures to protect the climate likewise tends to be more in favour of men's interests. Measures necessary to produce changes in behaviour do not receive a similar level of recognition and support.

(f) As reported by the gender disaster workshop in Ankara (2001),[11] women's human rights are not comprehensively enjoyed throughout the disaster process. Economic and social rights are violated in disaster processes if mitigation, relief and reconstruction policies do not benefit women and men equally. The right to adequate health care is violated when relief efforts do not meet the needs of specific physical and mental health needs throughout their life cycle, in particular when trauma has occurred. The right to security of persons is violated when women and girls are victims of sexual and other forms of violence while in relief camps or temporary housing. Civil and political rights are denied if women cannot act autonomously and participate fully at all decision-making levels in matters regarding mitigation and recovery.

Women are underrepresented in decision-making

45. The role of women role in communities is not formally recognized or accounted for in mitigation, adaptation and relief efforts. Women's knowledge about ecosystems and their strategies, experiences and skills for coping with natural disasters and water shortages are often ignored. Strategies and policies to cope with climate change are neglecting the gender dimensions of climate change and the current gender/climate-change agenda. Women are poorly represented in planning

[10] See example on eco-taxes in para. 27.

[11] The United Nations International Strategy for Disaster Reduction and the United Nations Division for the Advancement of Women, "Environmental management and the mitigation of natural disasters: a gender perspective", report of the expert group meeting, Ankara, 6-9 November 2001.

and decision-making processes in climate change policies, limiting their capacity to engage in political decisions that can have an impact on their specific needs and vulnerabilities. Vulnerability and mitigation were part of the 1988 United Nations International Panel on Climate Change agenda, but gender perspectives have still not been incorporated into its work.

(a) The level of women's participation in planning and decision-making on climate protection is very low even in industrialized countries, and this is linked above all to the heavily technical nature of and male dominance in key areas of work, such as energy, transport and town planning. Consequently, it is generally men who profit more from the newly emerging jobs in these areas, be it renewable energies or emissions trading.

(b) At both international and national levels, it remains difficult for women to gain recognition in the field of climate protection. While there is now a small and growing group of committed women and men in policy forums advocating that gender be taken into account, the response to the issues remains limited. At the national level, the picture is not much better. The integration of gender appears most likely to succeed at the regional and local levels, but even there it is the exception rather than the rule.

Gender biases in carbon emissions

46. In some instances, responsibility for emissions appears related to the gender-specific division of labour, economic power and the different consumption and leisure habits of men and women. For example, emissions connected with mobility have a clear gender component. In Europe, in both the work and leisure contexts, women travel by car less frequently and over shorter distances, use smaller, energy-saving cars and fly considerably less frequently than men.

(a) Women are over-represented as heads of low-income households and underrepresented in high-income groups. In this respect, income levels play a role in CO_2 emissions: the higher the income, the higher the emissions from larger houses with more electrical equipment, the bigger the cars and so on; the lower the income, the lesser the household's ability to use energy-efficient appliances, build energy-saving houses or purchase electricity and heat produced from renewable sources. Such differences must be addressed in climate-change mitigation policies. Lack of technical education also has an effect, since behavioural changes, including consumption patterns, cannot be made without knowledge of the challenges and options for reducing CO_2 emissions.

(b) Women and men perceive the cause of climate change (including CO_2 emissions) differently. In Germany, more than 50 per cent of women, compared to only 40 per cent of men, rate climate change brought about by global warming as extremely or very dangerous. Women also believed very firmly that each individual can contribute towards protecting the climate through his/her individual actions. However, policy planning does not reflect these perceptions in any way.

B. Lessons learned

47. Women at the international level have organized to influence climate-change negotiations and national policies, and important international networks promoting the role of women in energy and climate change have been established, including the Gender and Climate Change Network established by LIFE, Women in Europe for a Common Future, the South African Gender and Energy Network, and ENERGIA during the ninth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change.[12]

48. A concept for integrating the gender perspective in United Nations climate-protection negotiations has been drawn up by women's networks in Germany supported by women's groups worldwide. Entry points for incorporating a gender perspective as well as strategies and possible alliances are identified. Initial steps towards implementation are planned for the eleventh session of the Conference of the Parties at the end of 2005, including a strategy workshop, a women's caucus and a "climate talk" to present the issues to high-level representatives. A workshop, to be organized jointly with the Intergovernmental Panel on Climate Change, will aim to close, in the medium term, the considerable gaps in research.

49. At the local level, women provide particular kinds of social capital for mitigation, adaptation and coping with environmental change, actively organizing during and after disasters to help their households and community.

50. In situations where climate change programmes and policies have recognized gender differences within the same community, household or stakeholder groups, there have been several benefits. For instance, unlike many other communities in Honduras, no deaths were reported after hurricane Mitch in 1998; six months earlier, a disaster agency had provided gender-sensitive community education on early warning systems and hazard management. The community decided to involve women and men equally in all hazard management activities and women took over the task — abandoned by men — of continuously monitoring the early warning system. As a result, the municipality was able to evacuate the areas promptly when hurricane Mitch struck.

Climate programme 2004-2008, Lower Austria: gender mainstreaming

The government of the Austrian federal state of Lower Austria has applied gender mainstreaming to its newly established climate protection programme. Five gender-mainstreaming measures have been drafted and assigned to the over 200 climate protection measures, to be taken into consideration during implementation. Resistance was substantial, which is why at the end of the agreement process only five mainstreaming measures remained, although there had originally been double that number. These are as follows:

- Representation of women in decision-making positions;
- Equality of opportunity in planning, organization and promotions;
- Promotion of women in technical occupations;

[12] See www.gencc.interconnection.org.

- Inclusion of gender aspects in training;
- Inclusion of gender aspects in press relations work.

An initial review of implementation of the climate programme will be carried out in 2006, when implementation of the gender mainstreaming components will also be reviewed.[13]

51. Women are able to map their risks and vulnerabilities from their own standpoint and to play an important role in early warning. Women's knowledge in adaptation (traditional and community-specific) could be an important resource.

Women have a deep understanding of their environment

Inuit women in Northern Canada have always had a deep understanding of weather conditions, as they were responsible for assessing hunting conditions and preparing the hunters accordingly.[14] During a drought in the small islands of the Federated States of Micronesia, it was local women, knowledgeable about island hydrology as a result of land-based work, who were able to find potable water by digging a new well that reached the freshwater lens.[15]

52. Tapping women's interest in disaster mitigation and preparedness has led to improved community welfare during and after disasters. Ensuing strategies, including gender-sensitive target group analysis, identification and preparation of safe areas for villagers to escape floods, establishing local early cyclone warning monitoring and communication systems, research on indigenous resilience practices and the creation of women-accessible emergency loan funds, help the poor reduce their risks in natural disasters.

53. Through improved access to resources, technologies and finance, women have been more likely to increase efficiency in their use of renewable energy and thus to mitigate climate change. More secure access to resources from forests and protected areas has resulted in less deforestation and maintenance of carbon sinks, while improved access to safe water for humans and animals has enabled dry-land women to have more time for livelihood and subsistence activities.

[13] See http://www.fonafifo.com/english.html.

[14] See http://www.iisd.org.

[15] Cheryl L. Anderson, "Gender matters: implications for climate variability and climate change and for disaster management in the Pacific islands", in InterCoast, Winter 2002.

Costa Rica's programme to promote conservation and carbon emission mitigation

Since 1996, Costa Rica has been implementing a programme to pay for environmental services, to promote and encourage conservation, reforestation, carbon emission mitigation and its greenhouse effect and the sustainable management of Costa Rica's natural resources. The programme offers economic rewards to landowners who do not cutback the forests on their land. The problem also encompasses ownership issues, since most landowners are men and women have little access. To help solve this problem, the national institution in charge of implementing the programme as well as of promotion of gender equity, levies a fee to ensure that a certain amount of the takings goes to supporting women to become landowners.

54. Improvements in family income have reduced the need for males to migrate to urban and other areas, thereby increasing rural labour availability for anti-desertification and reclamation practices (for example, soil and water conservation, cut-and-carry fodder systems, intensive agro-forestry systems) and enabling traditional ecosystem management practices to be passed on by both women and men.

55. Gender-sensitive methods of problem analysis, situation description and impact assessment will have to be developed for climate change contexts. Instruments such as gender-impact assessment can already be applied and can be developed further during the process of application. For all instruments and measures relevant to climate protection, in local areas and regions as well as at the national and international level, an impact analysis should be conducted regarding the situation of women and men and how gender justice and climate protection can be mutually reinforcing. Questions include: What is the socio-economic situation forming the backdrop to these measures? Is care work and its requirements recognized and taken into account? How is this reflected in the general situation (for example, financial aid, information, supportive measures)?

Toolkit: Climate for change — gender equality and climate change policy

The Climate Alliance of European Cities conducted its first gender project between 2003 and 2005. In cooperation with 10 cities in four European countries, the situation of women in municipal climate protection bodies was examined and instruments were discussed with a view to increasing the proportion of women in decision-making positions.

Discussions also touched on the ways that increasing the proportion of women would contribute to climate protection, and whether a more gender-sensitive climate protection policy could automatically be expected as a result. Even though questions were left unanswered, there was interest to continue working on them in the future.[16]

Seven principles for engendered relief and reconstruction: "Nothing in disaster work is gender-neutral"[17]

- Think big: gender equality and risk reduction principles must guide all aspects of disaster mitigation, response and reconstruction. The window of opportunity closes quickly;
- Get the facts: gender analysis is not optional or divisive, but imperative to direct aid and plan for full and equitable recovery;
- Work with grass-roots women: women's community organizations have insights, information, experiences, networks and resources vital to increasing disaster resilience;
- Work with and develop the capacities of existing women's groups;
- Resist stereotypes: base all initiatives on knowledge of difference and specific cultural, economic, political and sexual contexts, not on false generalizations;
- Take a human rights approach: democratic and participatory initiatives serve women and girls best. Women and men alike must be assured of the conditions needed to enjoy their fundamental human rights, as well as simply survive;
- Respect and develop the capacities of women: avoid overburdening women with already heavy workloads and family responsibilities.

[16] See http://www.climateforchange.net.

[17] Developed by the Gender and Disaster Network.

V. Conclusion

56. The present paper provides background information and lessons learned concerning the gender aspects of energy for sustainable development and climate change, with the hope that the material contained therein will be taken into account in the discussions during the fourteenth session of the Commission on Sustainable Development and in the recommendations made at the fifteenth. Although the gender issues discussed in the present paper may be unfamiliar to some Commission participants, they are very important concerns for women and men throughout the world. Attention to the lessons and challenges reported in the present document will increase the equity and effectiveness of energy for sustainable development and climate-change policies and initiatives adopted by national Governments, international agencies, donor countries, non-governmental organizations and others involved in development decisions.

57. There is a need to refocus the thinking and the debate on energy for sustainable development and climate change to include a human rights perspective. Integrating a rights-based approach to access to sustainable and affordable energy will help to recognize and take into account women's specific needs and human rights. Current economic models based primarily on privatization strategies do not include accountability in terms of meeting people's basic needs.

58. Women must be recognized as agents of change who have a significant role to play in creating sustainable models for energy consumption and production, and in responsible climate-change mitigation and adaptation efforts. There is an urgent need to include gender equality and involvement of women at all environmental planning and decision-making levels. Empowerment through capacity-building and technical training will increase women's capacity to effectively participate in energy policymaking and decision-making bodies.

59. Finally, addressing the absence of the gender dimension in the United Nations Framework Convention on Climate Change and the scarcity of research focusing on the gender aspects of climate change will also help to build a more consistent and solid approach regarding climate-change policies.